



# **U.S. Shorebird Conservation Plan**

# **National Shorebird Education and Outreach Plan**

May 2000

A Technical Report of the Education and Outreach Working Group of the  
U.S. Shorebird Conservation Plan

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# National Shorebird Education and Outreach Plan

## Vision Statement

The Shorebird Conservation Plan, through outreach and education, provides guidance and flexibility to address targeted audiences with appropriate tools to improve people's attitudes, knowledge, and behaviors about shorebirds and their habitats.

## Executive Summary

Although a small percentage of American people are knowledgeable about shorebirds and related management concerns, the vast majority have little or no understanding of the importance of shorebirds and their habitat. This lack of understanding is one reason shorebirds are being affected by human activities. Research has documented that public awareness and education is one key element to advancing management plans. If people are aware of shorebirds and habitat needs, and if these issues are made relevant and meaningful, citizens are more likely to participate in resource planning and management programs.

In order to ensure the conservation of shorebirds and the habitat upon which they depend, it will be necessary to develop and implement programs that raise awareness as of the unique biological and ecological challenges facing shorebirds. These programs, both local and regional in scope, should serve to educate targeted audiences (farmers, beach-goers, resource managers, etc.) as well as provide information on shorebirds for the general population. The Education and Outreach Working Group outlined four tasks that would be necessary

in order to accomplish this:

- 1) Identify existing resources on shorebirds;
- 2) Determine conservation priorities for shorebirds;
- 3) Develop specific outreach plans, with identified outreach tools and audiences, to address priority issues; and
- 4) Develop a dissemination plan for the outreach and education materials and programs.

The U.S. Shorebird Conservation Plan will be most effective if collaboration occurs among government and non-governmental organizations, individual stakeholders within or near shorebird habitats, bird watchers nationally and internationally, educators, and families. The educational programs of Partners in Flight will serve as a good working model for implementation. This would allow regional working groups to determine their highest priority goals and share them with the national working group annually.

The Education and Outreach Working Group surveyed individuals from agencies and organizations to find out what materials they used at their site to educate people about shorebirds and their habitats. We found that most of their education and outreach efforts were targeted at stakeholders, community members, educators, and land managers within their geographic area. A Directory of Shorebird Education Materials and Services was developed, that includes all the materials and programs currently identified by the working group members and those individuals surveyed. Most of the materials have been developed for the U.S. but some are broader in scope and incorporate audiences within the Western Hemisphere. Trends and gaps in the directory are 1) a

lack of materials for specific adult audiences 2) resources that used to exist are now out of print, and 3) K-12 educational resources are not aligned to the National Science Standards. The working group recommends filling these gaps by disseminating the Directory of Shorebird Education Materials nationwide, aligning the education materials to the National Science Standards, developing new materials that specifically target priority issues and audiences, and evaluating the effectiveness of the materials.

Regional Working Group members were surveyed to determine the highest conservation priorities for shorebirds. The results showed that habitat loss was the highest priority issue facing shorebirds today. Other issues identified were impacts from agriculture, direct disturbance of foraging or resting birds, degradation of habitat, and habitat impacts from climate change. Outreach tools were then developed to match those national priority issues. Two national and two regional plans were developed. The regional plans were developed to be adaptable to other regions. These four outreach plans include 1) Shorebird Sister Schools and Sister Cities Programs 2) Shorebirds Are Good Neighbors - National Campaign 3) Protecting Shorebirds and Coastal Habitats on the Massachusetts Coast, and 4) Delaware Bay Shorebird Conservation. Short and long-term budgets were identified for each specific outreach plan.

A dissemination plan was developed to help guide implementation of the Shorebird Outreach and Education Plan. Training is necessary to give people the knowledge and skills necessary to educate others about shorebirds and their habitats. The U.S. Fish and Wildlife Service National Conservation and Training Center is willing to help with some specific training for shorebird education, and is also willing to incorporate

a shorebird conservation section into several existing courses. At least 24 other sites in the U.S. reported that they have the capabilities to do shorebird education training. In order to let people know about the existing shorebird education materials and programs, the group plans to distribute the Directory of Shorebird Education Materials and Services nationally.

Collaboration and communication between and amongst shorebird working groups is essential to the success of the National Shorebird Conservation Plan. Each working group needs to be an integral and equal part in the overall planning process. As the plan is implemented, the working groups need to meet and share their data, information, and updates.

## Task 1- Existing Resources

This Section addresses existing resources through two of the Education Working Group's efforts. First, we compiled a Directory of current conservation/wildlife educational services and products relevant to shorebirds. Second, we surveyed organizations to learn about their outreach efforts.

To learn what materials, products, and services already exist for shorebird education, the Group sent a "request for information" to government and non-governmental organizations, and to shorebird list servers nationally. Forty responses were received and compiled into a Directory of Shorebird Education Materials and Services. While the material varied greatly, some trends in the type of information available can be identified. Most materials have been developed for audiences in the U.S., although some are broader in scope and incorporate audiences within the Western Hemisphere. Some materials have been developed for broad adult audiences, however, most is targeted towards K-12 audiences. In a few cases, specific stakeholders were targeted (e.g. farmers, birders, and wildlife managers).

While the "request for information" yielded an array of materials, certain gaps surfaced in the information available. These are 1) a lack of information for adult audiences; 2) out of print materials, and 3) dissonance between K-12 educational resources and National Science Standards. In order to address these issues, the Group recommends disseminating the Directory of Shorebird Education Materials nationwide, aligning the education materials to the National Science Standards, developing new materials that specifically target priority issues and audiences and evaluating the

effectiveness of materials produced.

After analyzing and compiling the resources available on shorebirds, the Group developed an Outreach Survey to determine current national education and outreach efforts for shorebirds and their habitats. State and federal agencies, non-profit education organizations and international organizations were asked about current education/outreach efforts, future outreach needs, and the capacity of their organization to deliver shorebird education services. Fifty organizations responded to the Outreach Survey, providing the Group with excellent information for outreach planning.

Respondents were asked a variety of questions on the type of materials used, the nature of their audience, the type of messages they feel are important, and the tools needed to assist in delivering these messages. The survey revealed that interpretive tools such as slide presentations, brochures and fact sheets, are widely used. It also found that the audience reached can be categorized in four groups:

- Stakeholders (e.g. farmers, fishermen)
- Community members (e.g. families)
- Educators (e.g. school teachers, environmental education specialists)
- Land Managers (e.g. refuge manager, estuary reserve manager)

Survey respondents reported that key messages included the recognition of critical shorebird habitat and threats to these areas; the diversity of shorebird species; and their life history (i.e. feeding, migrating, etc.). Additional messages were that land owners and managers needed to know how to manage land for shorebirds without compromising other objectives; and that citizens needed to know the roles of federal and state agencies in the management of shorebirds. Respondents felt that the

following tools could be helpful in communicating all of these messages:

- 1) Templates to make regional materials site specific
- 2) National or regional speakers bureau
- 3) Materials to enable interpretive centers to teach about shorebirds (e.g. traveling exhibits)
- 4) Tools to illustrate concepts to wildlife managers (e.g. slide shows, videos)
- 5) Reliable clearinghouse of information for the media to use in news articles
- 6) Results of current research
- 7) Materials that target teenagers
- 8) Materials for specific issues/priorities, targeting key audiences

Most organizations surveyed are set up to deliver key messages and support future education efforts, but would benefit from some national coordination. In particular, they want to increase community involvement, expand partnerships and facilitate better management with private landowners. Taking advantage of the World Wide Web and distance learning capabilities could serve to broaden the scope of the national outreach efforts.

## **A. Documentation of Existing Resources**

### **1. Directory of Shorebird Education Materials and Services**

To learn what materials, products, and services already exist for shorebird education, our working group sent out a “request for information” inquiry. The inquiry sheet was sent to government and non-governmental organizations, and to shorebird list servers nationally. We received about 40 responses. From these responses, we created a Directory of Shorebird

Education Materials and Services (Appendix A).

Most curricula, projects, videos, and posters target school groups. Some materials were developed for broad adult audiences and, in a few cases, specific stakeholders were targeted (e.g. farmers, birders, and wildlife managers). A library of existing resources has been started and will be housed in the Manomet Center for Conservation Sciences.

We did not include generic wetlands or general birding educational materials in the directory. However, if the wetland materials specifically emphasized the value of wetlands as shorebird habitat, they were included in the directory.

### **2. Trends and Gaps**

- a) Many resources are scattered or out of print.
- b) Most of these materials are aimed at students in grades K-12
- c) Several materials have not been aligned to the National Science Standards (Standards for science education that all formal school teachers use)
- d) New materials are needed for specifically targeted adult audiences

### **3. Future Recommendations for the Directory:**

- a) Disseminate the Directory nationwide and put it on the World Wide Web.
- b) Align school materials to the National Science Standards.
- c) Search for additional education/outreach materials that specifically target our conservation priorities.
- d) Evaluate materials.
- e) Develop new materials for target audiences that meet the conservation priorities identified in the Plan (Task 2).

## **B. Education/Outreach Efforts by Organizations**

The Education Working Group developed an Outreach Survey to determine the current national education and outreach efforts for shorebirds and their habitats (Appendix B). They surveyed state agencies, federal agencies, non-profit education organizations (such as science centers, aquariums, and Audubon chapters), and international organizations. In the survey, they asked about current education/outreach efforts, future outreach needs, and the capacity of their organization to deliver shorebird education services. Fifty organizations responded to the Outreach Survey (list of respondents in Appendix C), providing us with excellent information for outreach planning (Appendix D).

### **Summary of questions asked:**

#### **“What materials/resources are currently used to get the message out?”**

Interpretive tools: slide presentations, brochures, fact sheets, signage, birding trips, and occasional articles in magazines.

Services included: Training volunteers to "watch" shorebird viewing areas and caution tourists not to disturb birds, volunteer monitoring projects, shorebird festivals, International Migratory Bird Day events that included shorebird education, distance learning broadcasts, coastal birding trails, and shorebird exhibits at several aquariums.

#### **“What audiences do sites reach through their outreach efforts?”**

These included 4 major categories:  
Stakeholders (e.g. farmers, fishermen)  
Community members (e.g. families)  
Educators (e.g. school teachers, environmental education specialists)  
Land Managers (e.g. refuge manager,

estuary reserve manager)

#### **"What messages need to get out in the future?"**

1) There are three critical habitats for shorebirds (breeding, staging, and non-breeding)

a) These include upland, coastal, and interior wetland areas

b) They are currently being threatened by development, contaminants, etc.

2) People need to know what shorebirds are, the diversity of shorebird species, and their life history (i.e. feeding, roosting, migration, breeding, etc.).

3) Land owners and land managers need to know how to manage for shorebirds without compromising other objectives.

4) Citizens need to know the roles of federal and state agencies that manage shorebirds.

#### **"What new materials/ resources are needed to get the message out?"**

1) Templates to make regional materials site specific

2) National or regional speakers bureau

3) Materials to enable interpretive centers to teach about shorebirds (e.g. traveling exhibits)

4) Tools to illustrate concepts to wildlife managers (e.g. slide shows, videos)

5) Reliable clearinghouse of information for the media to use in news articles

6) Results of current research

7) Materials that target teenagers

8) Materials for specific issues/priorities, targeting the key audiences

In summary, this information is important to guide our outreach efforts. Educators have some materials but need more to communicate future messages. They will require help from biologists and managers to insure that information is

current and accurate. Most organizations surveyed are set up to deliver the messages and support future education efforts, but would benefit from some national coordination. They want to increase their community involvement, expand partnerships, and facilitate better management with private landowners. Taking advantage of the World Wide Web and distance learning capabilities could serve to broaden the scope of the national outreach efforts.

Plains (3 responses), Northern Pacific (2 responses), Inter-mountain West, and Alaska.

## Task 2 - Conservation Priorities

The Education Working Group asked biologists and managers from other the Shorebird Plan Regional Working Groups what they felt were the priority conservation issues affecting shorebirds. Through the Plan's list server, members were asked to generate a list of issues, and from this information priority issues were developed. Major categories included: agriculture, habitat loss, disturbance, degradation, and climate change. This list was then given to the Regional Working Group Leaders who were asked to rank the national priorities as well as priorities for their region.

Major issues included: **agriculture, habitat loss, disturbance, degradation, and climate change.** We provided the list to the Regional Working Group Leaders and asked them to rank the national priorities and the priorities for their region. We asked them to query other people in their region and then return the responses to us. The regions that responded were Northern Plains, Central Plains/Playa Lakes, Southeastern Coastal

Table 1: High priority issues that would benefit from increased education and outreach.

**Priority #1 - Habitat Loss (15 responses total)**

<b>HABITAT LOSS- National Issue</b>	<b>Habitat Loss- Regional Issue</b>
Destruction of shorebird habitat (4)	Urbanization (2)
Wetland modification (1)	Filling in of prairie potholes (2)
Flood plain modification (1)	Destruction of shorebird habitat (1)
	Loss of upland habitat (1)
	Destruction of many shorebird habitats (1)
	Wetland modification (1)
	Flood plain modification (1)

**Priority #2 - Agriculture (9 responses total)**

<b>AGRICULTURE- National Issue</b>	<b>Agriculture- Regional Issue</b>
Pesticide application (1)	Salinization (2)
Grazing (1)	Depressed water levels (2)
Agriculture practices in general (1)	Grazing (1)
	Rice culture decline on s. coastal plain (1)

**Priority #3 - Disturbance (5 responses total)**

<b>DISTURBANCE- National Issue</b>	<b>DISTURBANCE- Regional Issue</b>
General disturbance (2)	Recreation disturbance (1)
Snow goose breeding grounds overuse (1)	Predators (1)

**Priority #4 Degradation (1 response total)**

<b>DEGRADATION- National Issue</b>	<b>DEGRADATION- Regional Issue</b>
Oil and chemical pollution (1)	//////////

Results are reported in Table 1. Climate change received no votes as a priority, and is not reported in a table, although two regions expressed concern about this issue. Numbers after each issue reflect the number of times respondents listed the issue as a priority.

**Results and Recommendations**

Based on this survey, habitat loss was the major category addressed by the Regional Working Group Leaders. Destruction of shorebird habitat in this category was the main national issue, and seven “sub” issues were listed under this main issue at the regional level, probably reflecting the diversity of challenges in different areas of the country. Agriculture was the second major category addressed and the types of “sub” issues were scattered at the regional

level.

We cautiously conclude that habitat loss should be the priority issue and should be the main content of future outreach planning. We say “cautiously” for two reasons. First, the sample size was small. Second, we realize that all the categories are intertwined and need to be “kept in mind” when developing an overall education strategy. This will eliminate the problem of oversimplification. Given these limitations, we believe the process used was the best way available to us to develop outreach tool recommendations.

**Task 3 - Outreach Tools**

Prior to developing outreach plans, target audiences were identified to ensure

the most success at reaching the identified goals. Categories for these audiences included those that were very active and supportive; neutral or passive; opportunists, who could display interest if there were benefits perceived, such as revenues or publicity; and the hard to reach or those who perceive the topic negatively.

Using the priority issues identified in Task 2, the Education and Outreach Working Group developed outreach plans to address the national priorities among target audiences. Two national and two regional plans were developed, with the regional plans being developed to be adaptable to other regions across the nation. These four outreach plans include 1) Shorebird Sister Schools and Sister Cities Programs; 2) The Great Shorebird Trail; 3) Protecting Shorebirds and Coastal Habitats on the Massachusetts Coast; and 4) Delaware Bay Shorebird Conservation. Short and long-term budgets were identified for each specific outreach plan and are listed in the Education and Outreach Working Group Report.

Using the priority issues identified in Task 2, the Outreach Working Group developed outreach plans specifically to address these priorities. Target audiences

were identified to ensure the most success at reaching the goals identified in each plan.

### **Audience Categories**

The Education Working Group identified four audience categories. The categories, listed below, express the degree of commitment and support various groups have towards conservation efforts.

#### **One - ACTIVE**

Very supportive and receptive. Ready to engage (e.g. Audubon members, bird watchers)

#### **Two - NEUTRAL/ PASSIVE**

Interest can be generated if approached properly Vast majority of people. (e.g Community members)

#### **Three - OPPORTUNISTS**

Interested if there are direct benefits, such as revenues or publicity (e.g. Chamber of Commerce)

#### **Four - HARD TO REACH**

Perceive topic negatively. Need to find common ground, and build trust.

## **Outreach Tool #1 - Shorebirds Sister Schools and Sister Cities Programs**

(Input from Heather Johnson-Schultz, Environmental Education Coordinator- Region 7, USFWS, Anchorage, Alaska)

### **Goal**

Build additional support and awareness of the Shorebird Sister Schools and Sister Cities Programs (SSSP and SSCP) across the U.S. to increase the support of wetland and shorebird conservation.

### **Audience (Categories One -Three)**

Very broad audiences, including but not limited to teachers, students, shorebird enthusiasts, resource managers, research biologists, city managers, city planners, community members, and families.

## Message

Shorebirds are long distance migrants that rely upon several wetland habitats for their survival. Each of these habitats is essential to their survival. Protecting these habitats in your area can be a major contribution to shorebird conservation.

## Project Description

Shorebird Sister Schools Program is an on-line international shorebird and wetland education program, consisting of a K-12 curriculum, E-mail list server, and World Wide Web site. Participants from around the world track Arctic-nesting Shorebirds to their nesting grounds in Alaska and the Canadian Arctic, and follow their returns south in the fall. Shorebird Sister Cities program is an extension of the Shorebird Sister Schools Program. It was developed to allow "Sister Cities" to network with each other about wetland and shorebird conservation initiatives; migratory bird ecotourism and shorebird festival ideas; and share information among shorebird enthusiasts worldwide.

## Strategy

A national coordinator and 3 regional coordinators will be established for the Shorebird Sister Schools and Sister Cities programs (SSSP and SSCP). To promote the programs, the coordinators will develop flyers for each program and will mail them nationally to schools, organizations, city manager/mayors offices, and Chamber of Commerce offices. The coordinators will also assist with training, building partnerships, and conducting educational programs and field trips for participants in SSSP and SSCP.

A contractor will be hired as a Web Master to maintain the World Wide Web site for SSSP and SSCP. The Web Master will post information to the Web site that pertains to the priority issues identified in the National Shorebird Conservation Plan, make links to related sites, and maintain current information on research and management of shorebirds throughout the U.S. The Web Master will also search the World Wide Web and determine who is linked to SSSP/SSCP. If shorebird or wetland conservation sites have not linked to SSSP/SSCP already, we will invite them to make a link to our site. In order to make stopover information available nationwide, maps will be produced for each of the major flyways in the Western Hemisphere and made available on the SSSP/SSCP Web page.

## Cost:

1) National and Regional Coordinators	\$40,000
2) Web Master (Contract fees)	\$ 6,000
3) Materials, products, handouts (Will vary each year depending on needs)	\$10,000

**Total (Annually, for 2 years) \$56,000**

## Outreach Tool #2 – The Great Shorebird Trail

Input from Nichole Cirillo, Manomet Center for Conservation Sciences

### **Program Description**

Over the past decade, there have been rapid increases in “eco-tourism”. While this term has many definitions, it is understood to mean travel to outdoor destinations that offer special contact and experiences with natural phenomenon. These events draw both local and distant visitors. Shorebirds that concentrate by the millions at relatively few sites in the Americas offer spectacular wildlife phenomenon that can provide an “anchor” attraction for tourists.

The Great Shorebird Trail (GST) is developing an international travel and tourism structure for critical shorebird habitat sites in the Western Hemisphere Shorebird Reserve Network. By promoting these sites as unique travel destinations, the GST will improve the civic involvement and economic benefits communities can derive from each site, thereby helping to protect those sites from development and other threats. The GST program manager will work with local committees to develop individual site activities that include shorebird festivals/peak visitation tours, web-based school connections and lists of related attractions and accommodations. Tourism “loops” will be created for each site that will list relevant attractions within the proximity of the site which will help to create partnership opportunities with state and federal wildlife agencies and historical commissions.

Sites will receive two kinds of support from the network-wide Great Shorebird Trail coordinating office. The first type will provide outreach materials and coordination that will include: 1) a Trail Guide Book; 2) a Trail Guide Map; 3) a GST Newsletter; 4) A GST Accommodation Guide; and 5) GST Brochures (GST general and site specific). The second type will provide technical support to selected sites to help them develop and expand their local activities. The GST will develop a website featuring a virtual “tour”, opportunities to share data and experiences, a GST Virtual Competition and a “witness” program, that encourages visitors to post photos taken at GST sites that reflect the importance of shorebirds. The GST will link festivals by promoting a “follow the bird” tour between sites. It will incorporate K-12 education by connecting with the Shorebird Sister Schools Program (SSSP). Specifically, the GST and SSSP webpage will be linked and SSSP information will be disseminated in GST literature. Budget needs and program details have yet to be determined.

### **REGIONAL EXAMPLES**

The following outreach plans are regional examples from the Atlantic Coast. However, they have been designed, with specific “common threads” to be adaptable to other regions (Appendix E).

#### **Outreach Tool #3 - Protecting Shorebirds and Coastal Habitats on the Massachusetts Coast.**

(Input from Wayne Petersen, Field Ornithologist, MA Audubon Society, Lincoln, MA)

## **Goal**

Protect shorebird habitat along the Massachusetts coast.

## **Audience (Categories Two and Three)**

Beach user groups such as: ORV drivers, dog owners, recreational beach goers, ultra-light pilots, surf fishermen, coastal conservation commissions, town-owned beach managers and beach associations.

## **Messages**

Shorebirds require high quality, specialized habitat for nesting, foraging and roosting. Human activity in New England can have a major impact on shorebird futures in the Western Hemisphere.

## **Project Description**

The Massachusetts Audubon Society (MAS) has been involved with coastal bird protection for over a century, and in 1987 officially established a Coastal Waterbird Program, which today has a full-time director, a supporting corps of seasonal interns and volunteers, and a healthy, self-supporting budget. The program effectively integrates education, research, advocacy, and conservation in ways that have made it a model for other states to follow throughout North America.

As of 1999, the outreach of the MAS program involves providing stewardship of more than 60 sites along 1200 miles of the Massachusetts coast. The program directly reaches over 10,000 people, and indirectly many more.

## **Strategy**

Establish direct contact with stake-holders: interns and volunteers at key coastal areas, using strategically placed brochures and information kiosks, signage at sensitive shorebird locations, slide presentations to local coastal groups/ coastal community organizations, outings and field trips for local politicians and conservation commission members. Produce attractive postcards to give out when interacting with beach users.

Approach clubs in coastal communities to explain importance of shorebird conservation to their community. Provide viewing opportunities to see shorebirds; have docents interpret. Sponsor a birding festival (e.g., Parker River NWR Piping Plover Festival) to highlight local shorebirds and their potential for creating a positive economic impact.

Organize a local conference to involve as many agencies and interest groups as possible to address problems associated with appropriate use of coastal beaches and wetlands.

Develop a core group of high donor constituents and highly committed individuals to serve as an advisory group that can lend credibility to shorebird conservation efforts.

Produce a "Shorebird Newsletter" to regularly update stakeholders/ interest groups about local successes in shorebird conservation efforts. Relate successes to national trends and efforts elsewhere.

Establish media contacts who will regularly feature short articles on shorebirds and profile what's happening with local shorebirds from week to week or month to month; invite reporters to visit high usage shorebird areas.

**Costs**

Coordinator	\$35,000
Interns	\$50,000 (12 interns @ \$4,000 each)
Newsletter	\$ 1,500
Brochures	\$ 2,000
Appeal letters, etc.	\$ 2,000
Total (Annually)	\$90,500

**Matching Funds/Contributions**

Leadership gifts:	\$70,000 (about 20+ people)
Donors:	\$25,000 (500 people)
State govt.:	\$10,000 (e.g., Dept. of Environmental Management)
Endowment income:	\$70,000 (amounts to about \$35,000/year)
Donated Matches:	\$75,000
<b>Total</b>	<b>\$250,000</b>

**Outreach Tool #4 Delaware Bay Shorebird Conservation**

(Input from Janis Burton, Director of Education, Manomet Inc. and Dale Rosselet, Director of Education, NJ Audubon Society)

**Goal**

Develop a sustainable harvest of horseshoe crabs that will sustain the shorebird populations, fisheries, and other animals that depend on the interconnected ecosystems of Delaware Bay.

**Audience (Categories one - four)**

Fishermen, local citizens along Delaware Bay, educators, and tourists

**Message(s)**

Horseshoe crab eggs are one of the major food sources for up to one million shorebirds utilizing Delaware Bay each year. A high density of horseshoe crab eggs is necessary to sustain the migrant shorebirds.

Pollution, human disturbance, and oil spills can seriously threaten shorebirds.

## Project Description

Human Disturbance, during peak migration, is one of the most critical threats to shorebirds. Harvest of horseshoe crabs is legal in both New Jersey and Delaware, and has been increasing rapidly since 1990. Migratory shorebirds, utilizing Delaware Bay, rely heavily on a high density of horseshoe crab eggs for their survival. Delaware Bay is the largest oil transfer port of entry on the East Coast, with billions of barrels (12.25 in 1990) of oil moving through the bay annually. Industrial facilities, the Salem Nuclear Power Plant (at the base of the River) and agricultural runoff along the Delaware River pose a continual threat to the Bay waters and tidal marshes.

## Strategy (Educators, local community members, tourists)

There are many very good education resources available for the Delaware Bay area on shorebirds and/or their wetland habitats. The education resources are being under utilized because people are unaware that they exist. A coordinator will be hired to distribute materials to the target audiences and to host local training sessions on shorebird life history and how to utilize the materials. A clearinghouse of existing resources on shorebirds will be established to make them more accessible. The coordinator will work with groups who wish to collaborate on pooling materials and offering participatory experiences such as walks or citizen's monitoring, etc. The coordinator will also work closely with scientists and managers to make sure that education efforts directly mirror their priorities and that current data is being distributed to key audiences.

## Strategy (Fisherman)

Establish better communications with fishermen by exploring some joint projects, such as an educational product that balances environmental and fishing concerns of the Bay, or talks by fishermen and environmental educators as part of a lecture series. In addition, the coordinator will work closely with fishermen and fishery managers to share current management and research information, from both sides, looking for ways to establish common ground and develop a closer working relationship. Ideas on how to achieve these goals include:

- 1) Target port associations or gear users.
- 2) Use Fisheries Council Newsletters-can lead into a meeting
- 3) Media (such as the National Fishermen's magazines)
  - 4) Make outreach brochures that fishermen can use
  - 6) Work with trained fishery observers

This would be a three-year effort. In year one, the coordinator would establish the clearinghouse, begin communications with fishermen, and develop the outreach materials. During year two, the coordinator and fishermen would complete the fishermen product/ project, and maintain the clearinghouse. During year three, the coordinator would help institutionalize the clearinghouse within one of the participating agencies/organizations, and continue to work with the fishermen on future project ideas.

## Cost

Coordinator	\$ 40,000
Clearinghouse	\$ 75,000
Travel	\$ 3,000
Project with fishermen	\$ 15,000
Facilitator	\$ 3,000
Total (Annually)	\$136,000

(Note: The budget for year two would be reduced to \$75,000/year and \$60,000 for year three)

## **Broad-based Outreach Recommendations**

Listed below are seven broad recommendations that should guide future outreach development. The U.S. Shorebird Conservation Plan Implementation team should have a staff member with a strong education background, who can ensure that these broad recommendations are part of all future outreach efforts. These recommendations could serve as criteria for grant proposals, product development, and evaluation.

### **1) Environmental Literacy**

The goal of using outreach tools is to develop an environmentally literate citizenry that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, and skills to work toward the solution of current problems, as well as the prevention of new ones.

### **2) Diversity**

The outreach tools should meet different audience needs (languages, cultural viewpoints, and have a Western Hemispheric viewpoint). In addition, the tools should be reaching target audiences for specific issues, building two way communications and partnerships. Finally, tools should recognize that there are many learning styles and should seek instructional strategies that match these styles.

### **3) Person to Person Contact**

Outreach tools are developed to reach wide-ranging audiences and large numbers of people through media and computer technology. However, resources also need to be given to allow one to one people contact, because this is often where real changes are made (and this method is quickly being lost in today's society). One to one communication helps avoid the "top- down" approach that can create mistrust.

### **4) Accountability**

Outreach tools need to be assessed. Criteria need to be established to determine the strengths and weaknesses of the tools over time. Evaluation needs to happen whether the change is quick or takes time. Plan implementation should allow funding to hire outside professional evaluators who have experience in designing and using qualitative and quantitative evaluation methods.

### **5) Training**

Outreach tools need a support structure for the people using it. We recommend training, sustained technical assistance, and long-term follow-up for the users. Several agencies are ready to help with training on a broad scale (e.g. The U.S. Fish and Wildlife Service, National Conservation and Training Center). A list was developed of the Outreach Survey participants who have the capacity to host shorebird training (Appendix F). Technical assistance could be provided through the Plan Coordinator's office, or regional offices in which environmental education is a key component. Support for long-term follow up is also needed to update materials, evaluate, and train new people (and re-train others).

### **6) National Science Education Standards**

With regards to school materials, the outreach tools need to integrate habitat and wildlife concepts that are part of the National Science Standards from K-12. The National Science Standards are a set of standards (content and process skills) for what all students should know and be able to do at various grade levels in science. They, with the other subject standards, form the foundation of the National Education Reform effort in the United States. The science standards, working with environmental education, develop a high level of science literacy among U.S. students.

### **7) Integrate Shorebird Education into Existing Programs**

There are many good environmental education programs in North America. These programs address a broad spectrum of important environmental topics, but few emphasize shorebirds. Our task will be to work with organizations that have environmental education programs to determine appropriate ways to integrate shorebird education into their networks, materials, and training. We recommend that the Plan continue to develop close partnerships with these programs.

For example, the Wonders of Wetlands Reference and Activity Guide (WOW!), from The Watercourse Program at Montana State University, is an excellent education resource for wetland educators. WOW! contains background information and wetland activities, but none specific to shorebirds. We could work with the publishers of WOW!, developing a shorebird supplement to be added to future editions of WOW!.

## Task 4. Dissemination Plan

One of the most important aspects of disseminating information on shorebirds is training people to conduct workshops and other outreach programs. Training of staff is needed to give people the knowledge and skills necessary to educate others about shorebirds and their habitats. The U.S. Fish and Wildlife Service National Conservation and Training Center (as well as 24 other sites gleaned from the Outreach Survey) can provide training for shorebird education that is designed to meet the objectives for the education portion of the Shorebird Plan. It can also incorporate a shorebird conservation section into several existing courses. Trainers will dedicate a section of the training to the development of outreach plans for the area in which the workshop is held. Site-based teams can implement outreach and education efforts targeted specifically for the shorebird conservation issues within their local area.

A Shorebird Education Materials Directory was developed to be distributed throughout the country. It will be reviewed and distributed nationally. If additional resources are developed, they will be added to the resource list, therefore it will be a very dynamic document, updated frequently.

### Outreach Planning

Individual outreach plans for specific issues must be prepared for each specific program, as they will vary depending on the outreach tool or audience.

### Shorebird Education/Outreach Training

U.S. Fish and Wildlife Service -  
National Conservation and Training

### Center

Work with the National Conservation Training Center, the Division of Refuges and the Migratory Bird Management Office within the U.S. Fish and Wildlife Service, and with other partners in the Shorebird Plan, to develop and conduct shorebird education training courses. The group recommends that training programs be designed to meet the objectives for the education portion of the Shorebird Plan, and include these components in the training:

1. Background on shorebird conservation issues.
2. Information on the objectives of the shorebird plan, particularly the ones that can be addressed by information and education.
3. Process for designing and planning education programs.
4. Particular education and outreach materials related to shorebird conservation (focusing on the conservation issues identified in the plan).

A team-based, train the trainer approach would ensure the best application of the training "back home", with teams from certain geographic areas or organizations going through the training together, developing an action plan for training more folks at the home site.

Trainers would dedicate a section of the training to develop outreach action plans for the local area where the workshop is held. This way, site based teams can plan to work together to implement outreach and education efforts targeted specifically for the shorebird conservation issues within their local area.

Prepare materials on various shorebird conservation issues that can be taught in two-to-four hour blocks within the context of other existing training sessions. These

materials could also be incorporated into various presentations for conferences or professional meetings (e.g. Partners in Flight, North American Waterfowl Management Plan meetings, North American Association of Environmental Education workshops).

Prepare a video tape presentation that summarizes the shorebird outreach and education efforts and provides some background on the shorebird conservation issues and ways viewers can participate in the effort.

Develop follow-up components to any training efforts: list server, conference calls, follow-up meetings, etc, so that participants can share experiences and be updated as to new developments and ideas.

### **Other Potential Training Opportunities Across the Nation**

Several partners have the capacity to do shorebird training at their site. At least 24 agencies and organizations who responded to the Outreach Survey said that they could do training (Appendix F). This list is by no means comprehensive, but gives some ideas of locations that might be able to assist with different training sessions in specific geographic regions. Various partners in shorebird and wetland conservation might be able to team-up to conduct more comprehensive training sessions, specific to local issues and needs.

### **Dissemination of Shorebird Education Materials Directory**

A Shorebird Education Materials Directory (Appendix A) was developed to be distributed throughout the country. We will review the Directory, make any necessary changes, and distribute it nationally. If additional resources are developed, they will be added to the resource list, therefore it will be a very dynamic document, updated frequently.

Copies of the Directory will be made available through the National Conservation and Training Center (FWS) and ABA Sales at the American Birding Association. Any materials that can be sold through ABA Sales will be added to their catalog, if they are not already listed. Distribution will also be made through the National Science Teachers Association, North American Association of Environmental Education, National Association of Interpreters, and universities across the country.

The Directory will also be distributed at migratory bird education workshops, Partners in Flight meetings, and shorebird working group meetings across the country. The directory will also be given to public broadcast stations, non-governmental organizations, and science citizens groups to distribute to their partners and constituents.

The Directory will be added to the Western Hemisphere Shorebird Reserve Network, Manomet Center for Conservation Sciences, and Shorebird Sister Schools/Sister Cities Web Pages.

### **Collaboration**

The National Shorebird Plan will be most effective if collaboration occurs between and amongst government and non-governmental organizations, individual stakeholders within or near shorebird habitat(s), bird watchers nationally/internationally, educators, and families. Partners in Flight may be a good working model that the National Shorebird Plan could adopt. This would allow regional working groups to determine their highest priority regional goals, sharing them with the national working group annually. Each of the three working groups should serve as equal partners in all aspects of the Plan (e.g. planning, funding, implementation).

Collaboration can also occur widely by supporting the existing shorebird education

programs. The Save Our Migratory Birds, Shorebird Sister Schools Program, Shorebird Sister Cities Program, Western Hemisphere Shorebird Reserve Network, and the new Western Atlantic Shorebird Association are very good models that can continue to be expanded to emphasize national and regional priority issues.

### **Communications**

Collaboration requires a strong communications network in order to be successful. Collaboration between and amongst working groups within the National Shorebird Plan is essential. The three major working groups should be in contact with each other to ensure they are guiding each other in the right direction, not duplicating efforts, and working towards common goals. E-mail list server communication is an excellent tool to provide a broad dissemination of information exchange. These electronic capabilities should continue to be used and expanded.

### **Long Term Implementation**

The National Shorebird Plan must be a dynamic plan that is evaluated frequently and adapted to meet current issues, trends, and conservation needs. The E-mail list server has worked very well in the past, and we strongly encourage the continuation of this tool for communications with all working group members. Annual working

group meetings, at the regional and national level, are required for long term success. Integration with international shorebird working groups, and other migratory bird working groups is essential. This will strengthen our national efforts, provide the strongest network, and will stretch our conservation efforts to their fullest. Working closely with the North American Waterfowl Management Plan, Partners in Flight, and other large national and international efforts is the best strategy to leverage funding, strengthen communications and provide for collaborative partnerships throughout the Americas.

The annual national working group meetings should include reports by the research group on the current data from on-going research projects, awareness of management concerns of shorebirds and/or their habitats, and updates on the education and outreach efforts. All three working groups should be given equal weight at these meetings. Updates should include both regional and national updates, reports from the yearly events, discussion of research, management and education efforts that will be focused on for the next year, and evaluation of how things are going. If updates are needed in the Plan, discussion of these updates could take place at this annual meeting

## **Appendix A: DIRECTORY OF SHOREBIRD EDUCATION MATERIALS AND SERVICES**

Introduction: During 1998-1999, the Education Working Group and associates compiled this Directory for the National Shorebird Plan. The Group decided to focus on materials that had at least some shorebird content. With a few exceptions, we excluded wetland education material, because of the large quantity available and the ease with which it could be retrieved.

Finally, most materials are geared for Educators who need teaching aids for school audiences or the general public. However, some materials/sections have been designated a Citizen Science Choice because they can be helpful for citizens and managers interested or involved in conservation, or educators who wish for in depth background information. Look for the symbol for the Citizen Science Choices, &, by these sections or individual items.

### **I. SHOREBIRD CURRICULA MATERIALS AND LESSON PLANS**

#### Arctic-Nesting Shorebird Curriculum by USFWS

This multidisciplinary guide is designed to help K-12 teachers lead investigations on shorebirds and wetland ecology.

Type of material/ service: Guide, poster, telecommunications program.

Audience: K-12

Language: English, Spanish, Russian, Japanese

Geographic focus: Western US

Content areas: Shorebird biology/ ecology, wetland /coastal conservation, migration

Order from: Circumpolar Press, PO Box 1125, Homer, AK 99603. (877) 210-2665, toll free in US, or (907) 235-8757 (wizard@xyz.net) (Note: Order the English version from the above address. For foreign language versions, contact USFWS, c/o Heather Johnson-Schultz: heather\_johnson@fws.gov or (907) 786-3367.

Cost: \$22.95 + postage

#### The Atlantic Coast Piping Plover Lesson Plans by New England Field Office, USFWS

These lesson plans present good activities to address the Piping Plover situation along the Atlantic Coast region.

Type of material/service: Guide, slide show and script

Audience: Elementary and middle school

Language: English

Geographic focus: Eastern US

Content areas: Shorebird biology/ecology, wetlands/ coastal conservation, shorebird conservation

Order from: U S Fish & Wildlife Service, New England Field Office, 22 Bridge St., Unit #1, Concord, NH 03301, (603) 225-1411

Cost: Free, supplies limited

Discover Boundary Bay by Friends of Boundary Bay

These lesson plans are designed for educators within British Columbia studying wetlands and shorebirds.

Type of material/service: Curriculum

Audience: Elementary, middle, and high school

Geographic focus: British Columbia

Content areas: Shorebird biology/ecology, wetlands/coastal conservation

Order from: Friends of Boundary Bay, 1441 Station A Delta, BC, V4M3Y8

Phone: (604) 940-9810 or 1540

Cost: \$22.90 with shipping. A supplement, "Exploring Estuaries and Wondrous Wetlands" can be purchased, for \$12.50.

Great Lakes Piping Plover Lesson Plan by USFWS

Lesson plans present a solid set of activities to address the Piping Plover.

Type of material/service: Guide, slide show and script

Audience: Elementary and middle school

Language: English

Geographic focus: Central US

Content areas: Shorebird biology/ecology, shorebird conservation

Order from: US Fish & Wildlife Service, 2651 Coolidge Rd., East Lansing, MI 48823. (517) 351-2555

Cost: Available for loan only

Save Our Migratory Birds/Salven a Nuestros Pajaros Migratorios by Manomet Center for Conservation Sciences

Birds are used to demonstrate the interdependence between habitats along their migratory pathway throughout the Americas. Content focuses on shorebirds and landbirds.

Type of material/ service: Guide, field projects

Audience: Elementary and middle school

Language: English and Spanish versions

Geographic focus: North America- Atlantic flyway/ International

Content areas: General bird ecology/conservation, shorebird biology/ecology, shorebird migration, wetland and shorebird conservation, migration.

Order from: Manomet Inc., PO Box 1770, Manomet, MA 02345 (508) 224-6521  
Cost: \$14 in the US

Shorebirds: A Teacher's Guide to the Video by Washington State Office of Environmental Education

This booklet provides discussion and activity ideas on all phases of shorebird life. It complements the video, Wind Birds, but is also useful alone.

Type of material/ service: Activities and video  
Audience: Grades 3-12  
Language: English  
Geographic focus: West Coast of North America  
Content areas: Shorebird ecology, migration, conservation  
Order from: Washington State Office of Environmental Education- OSPI,  
2800 N.E. 200<sup>th</sup> St., Seattle, WA 98155-1418.  
Cost: Inquire

Solve the Crime: Save the Song of Spring! - Neotropical Migratory Birds and their  
Midwestern Connections by Iowa Ornithologists Union

The Guide is filled with things students will need to search for clues that help them discover the culprits behind population decline in shorebirds and other birds.

Type of material/ service: Guide and Toolkit  
Audience: Middle school  
Language: English  
Geographic focus: Midwest and international  
Content areas: Conservation  
Order from: Story County Conservation Board, McFarland park, 56461 180<sup>th</sup> St. Ames, IA,  
50010, (515) 232-2516  
Cost: \$14.00 for Guide. Toolkit is on loan.

Wild Things '98 "Shorebirds: Running on Empty" Activity Guide by USFWS

This guide, produced along with a video and poster, provides activities on shorebird ecology and the NWR system's importance in providing **habitat for birds**.

Type of materials/ service: Activity guide, poster, and video  
Audience: Upper elementary to high school  
Language: English  
Geographic focus: US with some emphasis on eastern US (Bombay Hook NWR)  
Content areas: Shorebird ecology, wetlands/ coastal conservation  
Order from: USFWS, National Conservation Training Center, Rt. 1, Box 166,  
Shepherdstown, WV 25443, (304) 876-7203.

**Cost: Inquire**

## II. INTERNET SITES WITH SHOREBIRD CONTENT

Biogeographical Profiles of Shorebird Migration in Midcontinental North America- Shows distribution patterns of shorebirds during migration in the interior sections of the U.S.- <http://www.mesc.usgs.gov/shorebirds>. □

Bombay Hook National Wildlife Refuge- Provides information about shorebird migration, horseshoe crabs, and events- <http://www.refugenet.com/bombay.htm>. □

Delaware Bay Home Site- Provides updates on shorebirds in this region and good links- <http://www.delawarebay.com/index.htm>. □

International Migratory Bird Day - Celebration information on IMBD. Activities include bird walks, displays, videos- <http://www.fs.fed.us/dxnf/IMBD.html>.

International Shorebird Survey- Citizen monitoring project and updates- <http://www.manomet.org/ISS.htm>. □

National Audubon Society's Horseshoe Crab Campaign- Information about the crab, shorebirds, and conservation efforts- <http://www.Audubon.org/campaign/horseshoe>. □

Journey North- Program that engages students in a global study of wildlife migrations (including shorebirds) and seasonal change) - <http://www.learner.org/jnorth/jnorth.html>

Natural Phenomena: Horseshoe Crabs and Shorebirds- Ecology of shorebirds and dependence on the crabs- <http://www.hsrl.rugters.edu/nat.phen.html>. □

Piping Plover Guardian Program- Conservation and recreation relating to the Piping Plover in Atlantic Canada- <http://cfn.cs.dal.ca/Recreation/Fields Naturalists/guardian.html>. □

River Network Online- Provides tools to help people organize to protect and restore rivers and watersheds- <http://www.rivernet.org/~rivernet>. □

Save Our Migratory Birds- Provides information on this student exchange program, activity ideas, and updates- <http://www.manomet.org/SOMB.htm>.

Shorebirds- General information including maps, species and state lists (Peter Hertzels Web Page)- <http://www.utm.edu/~phertzels/shbird.htm>. □

Shorebird Watcher- Includes species, festivals, art gallery, quizzes and voice links. □ (The Shorebird Watcher by Dick and Jean Hoffman)- <http://pw.netcom.com/~djhoff/shorebrd.html>.

Shorebird Sister Schools Program- Sponsored by the USFWS, has maps, migration facts,

activities, and provides a data exchange between schools- <http://www.fws.gov/r7enved/sssp.html>.

Shorebird Sister Cities Program - Sponsored by the USFWS, has shorebird life history, environmental jobs, shorebird festivals, land use planning, and shorebird conservation - <http://www.fws.gov/r7enved/SisterCities/SSSCframe.htm>.

Surf Your Watershed- EPA's Office of Wetlands, Oceans, and Watersheds'site <http://www.epa.gov/surf>. □

Western Atlantic Shorebird Association (WASA), Association of people dedicated to the study and conservation of shorebirds along the western Atlantic. - <http://www.vex.net/~hopscoct/shorebirds>. □

Wetlands International- Part of the Wetnet group. Has lots of information and links to other sites. <http://www.wetlands.ca/index.html>.

WHSRN Western Hemisphere Shorebird Reserve Network- Includes a profile of all the WHSRN sites, shorebird information, news and links to their sites- <http://www.manomet.org/WSHRN.htm>. □

The Virtual Birder- Birding trips (such as to Delaware Bay, NJ and Monomoy Island, MA) and conservation information- <http://www.virtualbirder.com/vbirder>. □

### III. VIDEOS

#### The Amazing Journey of the Migrating Shorebirds by USFWS

Elementary, Junior, and high school students in Canada, the U.S. and Argentina study the migration of shorebirds and correspond electronically about their findings.

Type of material/service: Video (approximately 18 minutes)

Audience: Elementary, middle, and high school

Language: English

Geographic focus: Mid-west US and North America /international

Content areas: Shorebird migration, shorebird biology/ecology, shorebird conservation

Order from: USFWS, Prairie Pothole Joint Venture, PO Box 25486 DFC, Denver, CO 80225,

(303) 236-8145 X 678

Cost: Inquire

#### Birds of a Feather by Missing Links Productions □

Addresses the role ecotourism plays in protecting natural habitat. Visits Beaverhill Lake Alberta; Costa Rica, and Point Pelee; Ontario during spring migration.

Type of material/service: Video (22 minutes)

Audience: High school, adult  
Language: English, French, Spanish, closed caption, PAL  
Geographic focus: North America/ international  
Content areas: General bird ecology/ conservation, shorebird bird migration, bird/animal migration, ecotourism  
Order from: Missing Link Productions, 119 14th St., NW, Calgary, AB T2N 1Z6, Canada  
Cost: \$49.95 US

Connecting Flights, from The Nature of Things with David Suzuki □ by Canadian Broadcasting Corporation; 1992

Shorebird documentary covers their biology, habitat needs, and migration. The problems of protecting a chain of sites throughout the hemisphere, all essential for the migration and survival of the species is explored, as is WHSRN.

Type of material/service: Video (60 minutes)  
Audience: Middle and high school, adult  
Language: English  
Geographic focus: North America/international  
Content areas: Shorebird biology/ ecology, shorebird migration, conservation.  
Order from: Canadian Broadcasting Corp., The Nature of Things,  
PO Box 500, Station A, Toronto, ON M5W 1E6, Canada  
Cost: Inquire

Crabs, the Birds, the Bay by Natural Art Film □

Describes shorebird migration along the Delaware Bayshore and how dependent the birds are on horseshoe crab eggs.

Type of material: Video (18 minutes)  
Audience: High school, nonformal, adult  
Language: English  
Geographic focus: Eastern US  
Content area: Shorebird migration and shorebird conservation  
Order from: Bullfrog Films (800) 543-3764  
Cost: (Ask for non-profit rates.)

Delaware Bay Banquet □ by National Geographic (Judy Fieth + Michael Male)

Describes the synchrony of horseshoe crab egg laying and the arrival of shorebirds to this very important stopover area. Has wonderful footage of shorebirds and horseshoe crabs

Type of material: Video  
Audience: Middle and high school, adult, college, nonformal  
Language: English

Geographic focus: Eastern U.S.

Content area: Migration, wetlands/coastal conservation, shorebird conservation.

Order from: National Geographic has not formally released this video. Keep calling their education dept. to demonstrate the demand at (800) 368-2728. The video can probably be borrowed from conservation organizations that have copies.

The Living Tidal Marsh by the Public Service Electric Co.

Series and guides explore the tidal marsh of northeastern US and the creatures associated with it, including shorebirds. It also probes the effects humans have on the marshes.

Type of material/ service: Guides, videos

Audience: One (elementary), one (middle and high school).

Language: English

Geographic focus: Eastern US

Content areas: Shorebird biology/ecology, shorebird migration, wetlands/coastal conservation, shorebird conservation, bird/animal migration

Order from: NJN Video, CN 777, Trenton, NJ 08625-0777, (609) 777-5093

Cost: \$19.95 per video episode

Save Our Migratory Birds by Fundacion Vida Silvestre Argentina

Describes Argentina's conservation in Samborombon Bay, Province of Buenos Aires. Teachers and children describe their activities and feelings about the pen pal exchange.

Type of material: Video (30 minutes)

Audience: Elementary + middle school, nonformal/community

Language: Spanish

Geographic focus: North and South America/international

Content areas: Wetlands/coastal conservation, shorebird migration and shorebird conservation.

Order from: Fundacion Vida Silvestre Argentina, Defensa 245/51- P6, 1065 Capital Federal, Buenos Aires, Argentina. E-mail: educa@vidasilvestre.org.ar

Cost: Inquire

Wind Birds by Heron Cove Videos □

Has great shots of shorebirds in flight, as well as breeding avocets and stilts, and focuses on the natural history and beauty of the birds. Can be used with the Guide (see curricula section)-  
Shorebirds: A Teacher's Guide to the Video.

Type of material/service: Video (12 minutes)

Audience: High School, adult

Language: English

Geographic focus: Western US

Content areas: Shorebird biology/ ecology

Order from: Heron Cove, 3438 Madrona Beach Rd., Olympia, WA, 98502

Cost: Inquire

Wild Things '98 "Shorebirds :Running on Empty" Video by USFWS

Shows a live student satellite field trip to Bombay Hook NWR in 1998. Can be used in conjunction with the Guide (see curricula section) "Wild Things '98 Shorebirds: Running on Empty".

Type of materials/ service: Video

Audience: Upper elementary to high school

Language: English

Geographic focus: US with some emphasis on the east- (Bombay Hook NWR)

Content areas: Shorebird ecology, wetlands/ coastal conservation

Order from: USFWS, National Conservation Training Center, Rt. 1, Box 166, Shepherdstown, WV 25443, (304) 876-7203.

Cost: Inquire

#### IV. BOOKS

Beautiful Beachcombers Shorebirds by Arthur Morris, 1996. &

Describes, in layperson terms, different types of shorebirds and their ecology.

Extraordinary Horseshoe Crabs by Julie Dunlap, 1999.

Enriched with photos, describes the crab's ecology, the link with shorebirds, and the need for conservation. Good for upper elementary and middle school students. (ISBN 1-57505-293-8)

The Flight of the Red Knot by Brian Harrington w/ Charles Flowers, 1995. &

For high school and adult audiences, describes the Red Knot migration, shorebirds that breed in the Arctic. and winter in Patagonia and Tierra del Fuego. ABA sale price \$29.95. (800) 634-7736.

Flight of the Golden Plover- The Amazing Migration between Hawaii and Alaska by Debbie S. Miller, 1996. Designed for children, accurately and poetically describes this bird's annual migration. Beautiful illustrations add to the lessons of conservation and biology. Cost: \$15.95 (ISBN 0-88240-474-1)

Last of the Curlews by Fred Bodsworth, 1995 &

Describes the fictional account of a single Eskimo Curlew's 9,000 mile round -trip migration. ABA sale price \$13.95. (800) 634-7736.

The Wind Birds by Peter Matthiesson, 1994 &

Biology and behavior discussion reflects the poetry as birders glimpse in the live of these constantly wandering birds. ABA Sale Price \$11.20. (800) 634-7736.

## V. RESOURCE BOOKS/ BOOKLETS □

Birding Festivals & National Wildlife Refuges- Using Ecotourism as a Powerful Conservation Tool, Describes how to plan a bird festival and provides contacts of groups who have run successful shorebird festivals. Contact: USFWS/ Refuges at (703) 358-2339.

A Guide to Bird Education Resources: Migratory Birds of the Americas: An Annotated Bibliography, Guide reviews bird educational materials including shorebirds and wetlands. Contact: ABA at (800) 634-7736. Price: \$9.95 + s/h.

Massachusetts Shorebird Project Book- for Students and their Families, Provides family activities and information on shorebirds. Appropriate for upper elementary and middle school families in New England. English and Spanish versions. Cost: \$3.00 plus s/h. Contact: Manomet Inc., PO Box 770, Manomet, MA 02345, (508) 224-6521.

Shorebirds We Share, Booklet contains information on shorebirds, from the Arctic breeding grounds through migration and wintering in Central and South America. Contact: Canadian Wildlife Service's Latin American Program, Ottawa, ON K1A 0H3, Canada.

Shorebird Migrations, Fundamental for Land Managers in the US by Brian Harrington. Contact: Ducks Unlimited, One Waterfowl Way, Memphis, TN 38120, (800) 45-DUCKS.

## VI. MAGAZINES/ NEWSPAPERS/ COMICS

"Beach Bird Buddies." Ranger Rick 28:6, June 1994, by Benny Figueroa. Children help out The Nature Conservancy on Long Island, New York to help protect Piping Plover and Least Tern nests.

"Fuel for Flight." Audubon, May 1983 by John O. Biderman. Covers the Red Knot migration along the Atlantic flyway.

Marshbirds and Shorebirds of North Dakota by Scott Gomes. Provides natural history and ID of shorebirds in the region. Contact: ND Game and Fish Dept.'s Nongame Program, (701) 328-6612.

"Knot Your Ordinary Migrant." Bird Conservation, Late Winter/early Spring 1998, by Brian Harrington and Daniel Blanco

Seguismundo Descubre el Pastizal Pampeano, Spanish comic booklet describes the trip that the White-rumped Sandpiper makes and the conservation problems that he saw in the countries visited. Content areas include shorebird biology/ ecology, shorebird migration and wetland

conservation. Order from FVSA Defensa 245/51- P6, 1065 Capital Federal, Buenos Aires, Argentina. E-mail: [vidasilvestre.org.ar](mailto:vidasilvestre.org.ar). Cost: inquire.

“Shorebird Odysseys.” Natural History 107:4, May 1998 by Jim Corven. Provides information on shorebird ecology throughout the U.S., the importance of WHSRN sites, and conservation and monitoring efforts like the International Shorebird Survey program.

Shorebird Superheroes Newsletter by Prairie Pothole Joint Ventures and WHSRN. Children’s newspaper describes the importance of the prairie pothole region for resident and migrating shorebirds. Includes background information, puzzles, a comic, and stewardship suggestions. Contact: USFWS (303) 236-8415 ext. 678 or Manomet (508) 224-6521.

Spring Migration Guide (includes shorebird articles). Contact: NE Game & Parks Comm., 2200 N. 33rd St./ PO Box 30370, Lincoln, NE 68503-0370.

## VII. FACT SHEETS □

Horseshoe Crab/ Spring Shorebird Concentrations on Delaware Bay Fact Sheet, Contact: Cape May Bird Observatory: (609) 884-2736.

Managing Prairie Potholes for Shorebirds, Contact: WHSRN, c/o Manomet Inc., PO Box 1770, Manomet, MA 02345, and (508) 224-6521.

Managing Wetlands of the Intermountain West Region to Benefit Shorebirds, Contact: WHSRN, c/o Manomet Inc., PO Box 1770, Manomet, MA 02345, (508) 224-6521.

Mt. Plover and Piping Plover, Contact: NE Game and Parks Comm., 2200 N. 33rd St./ PO Box 30370, Lincoln, NE 68503-0370.

Piping Plovers, Contact: NYC Audubon Society, 71 West 23rd St, NYC 10010.

Publications, University of Delaware Sea Grant College Program, (Many resources on Delaware Bay and animal life). Ask for publications catalog: Contact: University of DE, Marine Communications Office, Sea Grant College Program, Newark, DE 19716-3530. (302) 831-8083.

Shorebirds + Agriculture, Contact: WHSRN, c/o Manomet Inc., PO Box 1770, Manomet, MA 02345, (508) 224-6521.

Wilson’s Phalarope: Great Salt Lake- Wildlife Notebook Series No.6., Contact: Utah Div. of Wildlife Resources, 1596 West North Temple, Salt Lake City, UT 84116, (801) 538-4702.

Upland Sandpiper, NH Endangered Species Program, Audubon Society of NH, PO Box 528-B, 3 Silk Farm Rd., Concord, NH, 03301, (603) 224-9909.

## VIII. BROCHURES □

Shorebirds! On Delaware Bay, NJ DEP, Div. of Fish, Game, & Wildlife, PO Box 400, Trenton, NJ, 08625. Informative brochure describing shorebird ecology, viewing locations, with photos, and map, 1994).

Delaware Bay Shorebirds, DE Div. of Fish & Wildlife, 89 Kings Highway, Dover, DE 19901. Brochure describes shorebird-viewing locations in DE and NJ, plus bird identification drawings, and text describing shorebird ecology and conservation, 1998.

Return of the Wetlands- Hackberry Flat, OK, OK Dept. of Wildlife Conservation, 1801 No. Lincoln, Oklahoma City, OK, 73105, (405) 521-3853. Describes efforts to restore the basin to its natural wetland condition to encourage shorebirds and other wetland species.

Sharing the Shoreline- Living in Harmony with Piping Plovers & Least Terns, NE Game and Parks Comm., 2200 N. 33rd St./ PO Box 30370, Lincoln, NE 68503.

## IX. POSTERS

The Amazing Journeys of Migratory Shorebirds, Prairie Pothole Joint Ventures and WHSRN project, Order from USFWS in Denver, CO, (303) 236-8145 ext. 678. &

Shorebird Migration Stopover Locations on the Pacific Flyway, Part of USFWS' Arctic-Nesting Shorebird Curriculum. Contact: heather\_johnson@fws.gov or (907) 786-3367.

## X. GAMES

Shorebird Migration Game/ El Juego De La Migración De Aves Playeras, This bilingual game, for upper elementary and middle school students, teaches the concept of migration, the concept of “fuel for flight”, and conservation lessons. Cost: \$20 + s/h. Contact Manomet Inc., PO Box 1770, Manomet, MA 02345. (508) 224-6521.

## Appendix B: SHOREBIRD EDUCATION OUTREACH NEEDS SURVEY

(Shorebird Education Working Group of the U.S. Shorebird Plan 1/99)

The Education Working Group is conducting this survey to determine the education needs and capacity of current and potential users of shorebird education. It hopes to learn what materials/resources are being used, capabilities of organizations, current outreach efforts, future plans, and what resources are needed to accomplish goals. All feedback will be used to provide recommendations to the U.S. Shorebird Plan, an effort to develop a cohesive conservation strategy for shorebirds and their habitats. You have been identified as an individual/ organization that can provide insights to this process. Please take a few moments and answer this survey. All answers should be given within the context of shorebird education. If a question does not apply to your circumstance just put (NA) in the space. Your feedback can be e-mailed to: Janis Burton (whsrn@manomet.org) or sent to me at: Manomet Center for Conservation Science, PO Box 1770, Manomet, MA 02345. Your help is greatly appreciated!

### I. Organization/Agency/Community Project:

Organization/ Individual Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Tel: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

### II. Your Current Education and Outreach Efforts:

What messages are being communicated by your organization now? (conservation, how to help, basic understanding of shorebird ecology, threats, specific issues, others)

What materials/ resources are you currently using to get the messages out? (Please provide titles and formats of materials. Format could be curriculum/ video/ etc.)

c) If you conduct shorebird education, please estimate audience contacts/ year.

\_\_\_ 100 \_\_\_ 1000 \_\_\_ 10,000 \_\_\_ 100,000

\_\_\_ % school age \_\_\_ % adult

d) If you serve adults, what kinds of adult audiences do you reach? (general public, teachers, farmers, land managers, etc.)

III. Shorebird Education and Outreach Needs for the Future:

a) What other messages need to get out and to whom should they be directed?

b) What other materials/ resources are required to get the messages out?

IV. Capacity of Your Organization/ Agency/ Project:

a) What are the capabilities of your organization/ project/ business with regards to shorebird education?

Disseminate existing materials \_\_\_\_\_

Create materials at a regional/ national scale \_\_\_\_\_

Education Staff available to teach concepts \_\_\_\_\_

Supporting experts (scientific/ management/ natural artists, graphic etc.) Please describe what type of expert (s). \_\_\_\_\_

Facility to interpret shorebirds/habitats to the public \_\_\_\_\_

Shorebird education training capabilities \_\_\_\_\_

Community support \_\_\_\_\_

Evaluation capabilities \_\_\_\_\_

Other: Please describe. \_\_\_\_\_

V. Future Plans:

a) What are your future shorebird education plans over the next 3 years?

\_\_\_ Increase involvement by communities to conserve local sites.

\_\_\_ Create partnerships with schools in environmental education activities.

\_\_\_ Facilitate better management by private landowners.

\_\_\_ Build an exchange/ clearinghouse.

\_\_\_ Other ideas. (Describe): \_\_\_\_\_

b) What is/are needed to accomplish your goals?

\_\_\_ Resources

\_\_\_ Collaboration

\_\_\_ Replicate existing resources

\_\_\_ Tie in with state education objectives.

\_\_\_ Other ideas (Describe): \_\_\_\_\_

c) What models, structures would help better forward shorebird education at regional and national levels? If so, who should be involved? (Govt., school, non-profit, international, other)

d) What other organizations/ individuals should we contact who are involved in shorebird education? Please provide names and phone numbers and e-mail addresses if possible. Thank you!

## Appendix C: OUTREACH SURVEY PARTICIPANTS

### State Agencies

AK Dept. of Fish & Game (Project Wild Coordinator)  
CA Dept. of Fish & Game  
CT. Dept. of Environmental Protection  
CO Div. Of Wildlife  
FL Game & Fresh Water Fish Commission  
GA DNR- Nongame Program  
Indiana Div. of Fish & Wildlife  
KS Dept. of Wildlife & Parks  
LA Dept. of Wildlife & Fisheries  
ME Inland Fisheries & Wildlife Div.  
NC Wildlife Resources Commission  
ND Game & Fish Dept.  
NJ Div. of Fish, Game, & Wildlife Dept.  
NY Dept. of Env. Cons.  
NY Div. of Wildlife  
NV Div. of Wildlife  
OH Div. of Wildlife  
OK Dept. of Wildlife Cons.  
SD Dept. of Game, Fish & Parks  
TN Wildlife Resources Agency  
TX Parks & Wildlife Dept.  
Utah State Div. of Wildlife Resources  
VA Dept. of Game & Inland Fisheries  
Virgin Islands, Dept. of Planning & Natural Resources  
Wyoming Game & Fish Dept

### **Federal Agencies**

Big Thicket National Preserve, Beaumont, T  
Bombay Hook NWR, Smyrna, DE  
Cape Cod National Seashore, Wellfleet, MA  
NPS Gateway/SIU/Great Kills Park, Staten Island, NY  
USFWS- Green Pt. Env. Learning Ctr., Saginaw, MI  
USFWS- Migratory Bird Mgmt., Anchorage, AK  
USFWS- National Cons. Training Ctr., (Div. of Education)  
USFWS- National Cons. Training Ctr., (Wildlife Branch)

### **Non-Profit/ Non-Govt. Organizations**

CT Audubon Society Coastal Ctr., CT  
Friends of Famosa Slough, San Diego, CA  
MA Audubon Society- Joppa Flats Ed. Ctr., Newburyport, MA  
Maritime Aquarium, Norwalk, CT

Monarch Grove Elementary School, Los Osos, CA  
New England Aquarium, Boston, MA  
Outreach Survey Participant List- (continued)  
The Nature Conservancy- Block Island Bio Reserve  
NJ Audubon Society  
Prince William Sound Science Ctr., Cordova, AK  
Save the Sound, Inc., Stamford, CT  
Sea Grant College Program, U.of Maine  
Sea Grant Extension/ Cooperative Extension, Durham, NH  
Univ. of GA Marine Extension Service Education Unit, Savannah, GA

**International**

Centro Informativo Natural Peninsular (CINAP), Ecuador  
Fundacion Vida Silvestre Argentina, Buenos Aires, Argentina  
Instituto de Ecologia AC, Zalapa, Veracruz, Mexico  
Museo de Ciencias Naturales, Tierra del Fuego, Argentina  
Wetlands International- Oceania, Australia

# Appendix D: SUMMARY OF SHOREBIRD EDUCATION OUTREACH SURVEY

## I. Current Education and Outreach Efforts

(State and federal agencies)

- 1) Included in general birding programs, field trips, etc.
- 2) Signage about disturbance of plovers
- 3) Shorebird education dovetails on wetland education + restoration.
- 4) Outreach towards user groups (recreational) at key nesting/staging areas
- 5) Some work w/land managers. Content includes biology, protection, and survey info.
- 6) Education coordination with permitting processes
- 7) Shorebird education programs and workshops and promotion
- 8) Poster series, magazines, monthly public TV programs that include wetlands + waterbirds
- 9) Viewing “ethics” are shared w/ beachgoers and bird watchers
- 10) Specific education directed at shorebird species and wetland habitats

(Non-govt. organizations + other countries)

- |                                     |   |
|-------------------------------------|---|
| 1) How to help conservation efforts | 8) Importance of migratory bird habitat   |
| 2) Shorebird festivals              | 9) Biodiversity (species)   |
| 3) Impacts of urban runoff          | 10) Preservation of open space  |
| 4) Threats, mgmt. shorebird ecology | 11) Adaptation  |
| 5) Piping plover/ ORV controversy   | 12) Field ID  |
| 7) Bird anatomy, food chains        | 6) Birds part of intertidal beach prog. 13) Conser. of salt lakes/shorebirds in (Ecuador) |

## II. Materials/resources used currently to get the message out

(State + federal agencies): Slide presentations, newspapers, manuscripts, professional publications, videos, comics, magazines, brochures, curricula (Project Wild, Sister Shorebird Schools, Save Our Migratory Birds), posters, field guides, signage, shorebird colored publications, TV programs + magazine, field trips, fact sheets, talks to birding groups, occasional articles in agency magazines, train volunteers to “man” viewing areas, volunteer monitoring projects, Shorebird Migration Game, coastal birding trails, public talks.

(Non-govt. organizations + other countries): Project Aquatic, mounted birds, aerial photos, samples of wetland vegetation, course notebook, Wild Things- 98 Running on Empty- Distance Learning Broadcast on Shorebirds, Video done by Extension Service, International Migratory Bird Day packets, video “The Crabs, the Birds, the Bay”. Temporary exhibits, staff hired to patrol/educate beach goers during nesting season, flier to fishermen purchasing fishing permits- the flier outlines monofilament hazards to wildlife, Junior Ranger – Piping Plover programs, photographic exhibit, ORV 5 minute video including need for piping plover protection, fact sheet

(USFWS- “Shorebirds- The Delaware Bay Connections”, “The Horseshoe Crab, A Living Fossil”, and DE Div of Fish & Wildlife- Del. Bay Shorebirds brochure). info poster about salt lakes + shorebirds, guide letter for teachers, news releases, “Cry of the Piping Plover –Play at Maritime Aquarium in CT., live shorebird exhibit (New England Aquarium).

III. **Average audience contacts/year** (Both govt. and non-govt.)

Ranged from 100 to 1000 for most. Those that did TV and magazines reported 10,000 to 100,000.

IV. **What Audiences are reached?**

(State and federal agencies): Birders, general public, farmers, developers while reviewing permits, land managers, outdoor recreationists, teachers, Armed forces, tourist guides, fishermen, nuns, sportsmen + women, special interest groups, university students, scouts, early childhood, land managers, waterbird surveyors, youth coordinators.

(Non-govt. organizations and other countries): Adult environmental volunteers, interviews w/ local media, Elderhostel, Kiwanis, ORV users (for Oversand vehicle permits), professors, parent chaperones of school field trips, editors of papers (sent press releases),

V. **Shorebird Education and Outreach Needs for the Future-** What other messages need to get out and to whom should they be directed? (both govt. and non-govt.)

What messages:

- 1) Shorebird habitat needs
- 2) Basic ID classes
- 3) Issues regarding staging shorebirds on habitats + disturbances, need to protect beaches
- 4) Need for shorebird habitat
- 5) Restoration
- 6) The message needs to be packaged for each group. It should include the significance each state plays in the annual cycle of shorebirds and critical habitat needs.
- 7) Emphasize migration, diversity, and particularly the feeding guilds.
- 8) awareness- (when people hear shorebirds- they immediately think ocean)
- 9) Shorebirds can be in land-locked areas.
- 10) Connection to global food sources
- 11) Vital role of NPS and other agencies in species protection
- 12) Endangered species policy,
- 13) Role of Volunteers in Parks + how public can get involved.
- 14) Spanish bibliography re: shorebirds/habitats (to help w/ message)
- 15) Maps (to help w/ message)
- 16) Conservation mgmt. message to the Ecuasel Company- Ecuador.

**Who should be reached:**

- 1) Issues directed to landowners and public land managers who need to know how they can manage for shorebirds without compromising other objectives

- 2) Materials for the general public
- 3) Materials for wetland managers (including waterfowl oriented managers)
- 4) State legislators/ politicians/ state agencies
- 5) Coastal developers
- 6) DNR associates
- 7) Consumers (food, energy, oil, pollution, chemicals)
- 8) Coastal developers
- 9) Wetland centers
- 10) NGO's to give them tools to lobby
- 11) Planning boards
- 12) Fisheries councils
- 13) Tourist bureaus
- 14) Agriculture organizations (like rice fields)
- 15) Secondary students to take part in active stewardship of key habitat areas

**VI What new materials/ resources are needed to get messages out?** (both govt./non-govt.)

- 1) Manuals or videos that help landowners + wetland managers know the value of wetlands, and ways to manage for shorebirds.
- 2) TV
- 3) Local interpretive centers enabled to teach about shorebirds
- 4) Packets similar to NWF's Nat. Wildlife Week (for schools)
- 5) Slide programs
- 6) Pamphlets/ fact sheets
- 7) Materials specific for my area
- 8) Regionally specific life history info.
- 9) Videos about shorebirds feeding- to help w/ better wetland management.
- 10) Supportive materials from CA and Mexico that lets U.S. see links w/ U.S. and shared flyways
- 11) More law enforcement signs
- 12) Speakers to assist w/ workshop
- 13) Hands on materials like shorebird kit/trunk
- 14) Web page
- 15) Tools (spotting scopes, shorebird models to help w/ identification Curriculum and visuals
- 16) Volunteer watch groups
- 17) Media coverage
- 19) Shorebird program that meets the MA Science and Technology Education frameworks
- 19) Materials that target teenagers w/ message of joys from watching/studying shorebirds.
- 20) Updated research and census data (continual)
- 21) Grant support for field resources (binoculars)

**VII. Capacity of organizations** (total govt. and non-govt.)

- Disseminate existing materials (36)
- Create materials at a regional/national scale (20)
- Education Staff available to teach concepts (27)
- Facility to interpret shorebirds/ habitats (25)

Shorebird education training capabilities (24)  
 Community support (21)  
 Evaluation capabilities (13)  
 Ability to support shorebird festivals (2)  
 Supporting experts- Included biologists, local teachers, photographers,  
 graphic designers, managers, community outreach coordinator, and videographer.

VIII. **Future Plans** (total govt. and non-govt.)

Increase involvement by communities to conserve local sites (19)  
 Create partnerships w/ schools in e.e. activities (19))  
 Facilitate better management by private landowners (13)  
 Build an exchange/clearinghouse (7)  
 Other (see original survey – subjects covered expanding interpretive capabilities, WHSRN involvement, state shorebird plan that has an ee component, work w/ various audiences, etc.,  
 Incorporate it into Japan- Shorebird Working Group meeting,  
 Distance learning across the state

IX. **Needed to accomplish goals** (both govt. and non-govt.)

Resources (28)  
 Collaboration (19))  
 Replicate existing resources (8))  
 Tie in w/ state education objectives (13)  
 Other ideas- personnel, better cooperation among conservation organizations, training, greater support from Executives of the land mgmt agencies

X. **Models to help better forward shorebird education** (both govt. and non-govt.)

Land owner contacts:

PIF  
 Bird Observatories  
 Project Wild  
 NWR  
 Non-profit  
 Schools sharing information on web.  
 TNC

International involvement:

Ducks Unlimited Model  
 More National –oriented NGO effort geared towards advocacy  
 Education at ground level  
 Joint Ventures  
 Audubon school program  
 USFWS Partners for Wildlife

Standardized program offered by NPS that can be modified for regions.

More environmental education programs in schools.

USDA involvement

Trying to adapt the earth Steward project toward assisting the USFWS (Steward McKinney Wildlife Refuge)

## Appendix E: COMMON THREADS

**Define Your Audience:** Most audiences need an immediate connection, in order to "buy into" helping shorebirds. Whoever owns or uses the area where shorebirds inhabit, is often the major target audience. Examples might be beach goers, rice growers, boat craft operators, etc.

Make scientific data and management recommendations easily available for educators to use in their teaching. Many people will join the efforts, if they understand the facts, if it makes connections to their needs, and if there are some benefits (e.g.- interior shorebirds eat insects). Use data to develop some "good news" stories. People will join efforts if they can see positive results.

**Strategy to Reach People:** Personal contact is an extremely effective way to reach people, even in a highly technical society. As examples, a beach monitor who asks a mother if her children might want to look into the spotting scope will have a good opportunity to educate. This will create a buy in--- vested interest.

**Financial Support:** Target Category 1 Audience (Active). These are the most committed group. Find these people at public functions that you might offer, such as shorebird festivals, slide presentations, etc. Seek opportunities to find supporters. Ask these supporters to use their influence and resources to help support education and scientific efforts.

Understand economics of the region. Promote the economic element or create one (i.e. birding festivals).

## **Appendix F: OUTREACH SURVEY PARTICIPANTS WITH TRAINING CAPABILITIES**

### **State Agencies**

FL Game + Freshwater Fish Comm.  
GA DNR- Nongame Program  
KS Dept. of Wildlife & Parks  
KY Fish and Wildlife Resources  
LA Dept. of Wildlife & Fisheries  
NY Div. of Wildlife  
OH Div. of Wildlife  
SD Dept. of Game, Fish & Parks  
Utah State Div. of Wildlife Resources  
Virgin Islands, Dept. of Planning & Natural Resources

### **Federal Agencies**

Bombay Hook NWR, Smyrna, DE  
Cape Cod National Seashore, Wellfleet, MA  
NPS Gateway/SIU/Great Kills Park, Staten Island, NY  
USFWS- Green Pt. Env. Learning Ctr., Saginaw, MI  
USFWS- Migratory Bird Mgmt., Anchorage, AK  
USFWS- National Cons. Training Ctr., (Div. of Education)

### **Non-Profit/ Non-Govt. Organizations**

CT Audubon Society Coastal Ctr., CT  
Friends of Famosa Slough, San Diego, CA  
MA Audubon Society- Joppa Flats Ed. Ctr., Newburyport, MA  
Manomet Center for Conservation Sciences  
Maritime Aquarium, Norwalk, CT  
New England Aquarium, Boston, MA  
The Nature Conservancy- Block Island Bio Reserve  
NJ Audubon Society  
Prince William Sound Science Ctr., Cordova, AK  
Save the Sound, Stamford, CT  
Univ. of GA Marine Extension Service Education Unit, Savannah, GA

### **International**

Fundacion Vida Silvestre Argentina, Buenos Aires, Argentina  
Museo de Ciencias Naturales, Tierra del Fuego, Argentina  
Wetlands International- Oceania, Australia